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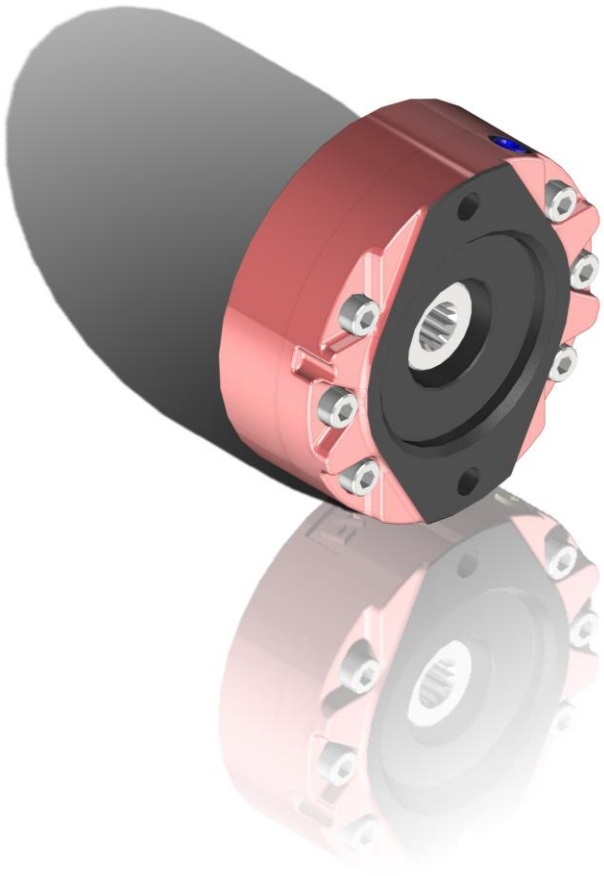
# Brake Service Manual – FBH13 Dry Series



Installation, Maintenance and Spare Parts Instructions

# Model: Short 'B' Mount (FBH13…..D) Series

Spring Applied, Hydraulically-Released Multiple Plate Brake for Dry Operation.

## PRE-INSTALLATION CHECKS.

### Mechanical.

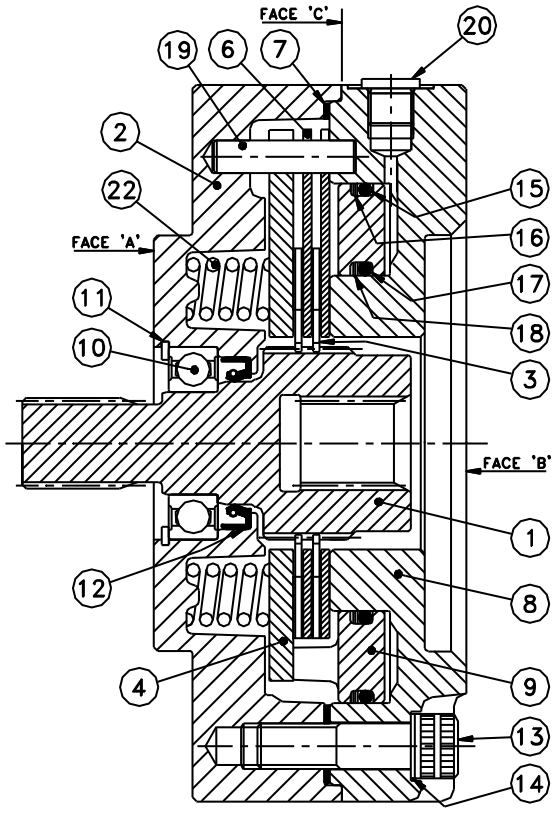
Check, that in the process of unpacking the brake and subsequent handling prior to assembly, the mounting features and other parts of the brake are undamaged. Ensure that the shafts to which the brake is mounted are clean and free from burrs and swellings.

### Hydraulic/Mechanical.

To check brake release, connect an appropriate hydraulic pressure supply set to the required level up to a maximum of 3000 psi (200 bar) and check that brake shaft (1) is free to rotate.

Remove hydraulic supply from brake, checking to ensure that the friction plates (3 & 6) have engaged thus preventing rotation of brake shaft (1).

**Important**, release pressure during bench testing should be limited to 2000 psi (138 bar) unless brake is fully installed using 2-off ½" UNC mounting bolts in the through (mounting) holes.




| Item | Part No. | Description | Qty |
|---|---|---|---|
| | | | |
| 1 ♣ | BHB-1002<br>BHB-1005<br>BHB-1009 | Brake Shaft | 1 |
| 2 | BHB-1303 | Housing | 1 |
| 3 ©c | BHB-1901 | Inner Friction Plate | 2 |
| 4 ©c | BHB-1401 | Pressure Plate | 1 |
| 5 ©c | 07901104 | Gasket | 2 |
| 6 ©c | BHB-1601 | Outer Plate | 2 |
| 7 ©c | BHB-1500 | Gasket | 1 |
| 8 | BHB-1102 | Cylinder | 1 |
| 9 | BHB-1202 | Piston | 1 |
| 10 ©c | SO01987 | Deep Groove Ball Bearing | 1 |
| 11 | SO01113 | Internal Retaining Ring | 1 |
| 12 ©c | SO01504 | Rotary Shaft Seal | 1 |
| 13 | SO08212 | Socket Head Cap Screw | 6 |
| 14 | SO09013 | Shakeproof Washer | 6 |
| 15 ©c | SO01476 | 'O' Ring | 1 |
| 16 ©c | SO02400 | Backing Ring | 1 |
| 17 ©c | SO01479 | 'O' Ring | 1 |
| 18 ©c | SO01621 | Backing Ring | 1 |
| 19 | SO09016 | Dowel Pin | 2 |
| 20 | SO09015 | Hexagon Plug | 1 |
| 21 | SO09523 | Plastic Plug | 1 |
| | | | |
| 22 ©c | BHB-1700 | Spring (Natural) | ♦ |
| 23 ©c | BHB-1701 | Spring (Blue) | ♦ |
| | | | |

♣ Brake shaft (item 1) varies with brake model number according to spline interface.
BHB-1002 is used with FBH13333..D
BHB-1005 is used with FBH13833..D
BHB-1009 is used with FBH13838..D

♦ Quantity of compression springs (items 22 & 23) will vary, depending upon the brake model used. (see chart on sheet 4 for further information).

Items marked thus ©c are recommended spares. Item 5 is an accessory kit supplied with each brake.

**See over for Maintenance Instructions**

# Installation, Maintenance and Spare Parts Instructions
# **Model: Short 'B' Mount (FBH13…..D) Series**
## Spring Applied, Hydraulically-Released Multiple Plate Brake for Dry Operation.

**Installation.**

Position 1-off gasket (5) over male pilot on brake housing (4).
Locate brake shaft (1) and secure brake in position using 2-off ½" UNC mounting bolts in the through mounting (fixing) holes provided.
Connect hydraulic pressure supply to brake pressure inlet port. Ensure that the hydraulic pressure is set to the required level up to a maximum of 3000 psi (200 bar) and check that the brake disengages and re-engages correctly.

**Maintenance.**

The brake is required to be kept in good working order and must be included in the planned maintenance program for the equipment to which the brake is installed. This must include torque testing together with inspection and replacement of the working parts such as friction plates (3 & 6) and, springs (22 & 23). The frequency of inspection depends on the duty demanded of the brake.

**Dismantling (and dis-assembly).**

To remove brake from its installed position, reverse procedure previously described in the **Installation** instructions.
Place the complete brake assembly on a clean, dry workbench.

Remove external gaskets (5) as necessary.

REFER TO DIAGRAMS FOR THE FOLLOWING.

1) Supporting brake on face 'A', remove the six socket head cap screws (SHCS) and washers (items 13 & 14) in equal increments to ensure the spring pressure within the brake is reduced gradually and evenly. Alternatively, if a press is available, the cylinder housing (8) can be restrained on face 'B' while removing the six SHCS and washers (13 & 14). The brake assembly can now be fully dismantled and the parts examined.
2) Remove cylinder housing (8) and piston (9) sub-assembly and dismantle if required, removing 'O' ring seals (15 & 17) and backing rings (16 & 18) as necessary.
3) Remove gasket (7) from housing (2).
4) Remove friction plates (3 & 6) and pressure plate (4). **Important:** Friction faces must not come into contact with oil or grease as this will seriously reduce the brake torque capacity.
5) Remove 2-off dowel pins (19).
6) Remove springs (22 & 23). **Note:** See chart on page 4 for spring arrangement and quantities for the particular brake model used.
7) Should it be necessary to replace ball bearing (10) or shaft seal (12), reverse remainder of brake sub-assembly, supporting on face 'C' of housing (2).
8) Remove internal retaining ring (11).
9) Using arbor press or similar to break 'Loctite' seal, remove brake shaft (1) from housing (2) and lay aside.
10) Reverse housing (2) and press out ball bearing (10). Shaft seal (12) can also be removed if necessary.

**Examination.**

All components can now be examined and inspected, paying particular attention to the following.

1) Inspect friction plates (3 & 6) and friction surface on pressure plate (4) for wear or damage.
2) Examine friction plates (3) and brake shaft (1) for wear or damage to the splines.
3) Examine input and output splines of brake shaft (1) for wear or damage.
4) Examine compression springs (22 & 23) for damage or fatigue.
5) Check ball bearing (10) for axial float or wear.
6) Examine 'O' ring seals (15 & 17) and backing rings (16 & 18) for damage.

**OBTAIN REPLACEMENT PARTS AS REQUIRED.**

**Assembly.**

Clean all parts thoroughly.
Reverse procedure previously outlined in **Dismantling** instructions taking particular care with.
a) Assembly of shaft seal (12).
b) Assembly of bearing (10).
c) Quantity and orientation of springs (22 & 23).
**Note:** See chart on back page for spring quantities and arrangement for the particular brake model used.
d) Assembly sequence of friction plates (3 & 6). - See diagram.

1) Lightly lubricate rotary shaft seal (12) and assemble to housing (2) taking care not to damage seal lip.
2) Apply ring of Loctite 641 or equivalent adhesive to full circumference of housing (2) bearing recess adjacent to shoulder.
Apply complete coverage of Loctite 641 to outside diameter of bearing (10) and assemble fully in housing (2), retaining with internal retaining ring (11). Remove excess adhesive with a clean cloth.
Press shaft (1) through bearing (10), ensuring bearing inner ring is adequately supported.

Installation, Maintenance and Spare Parts Instructions

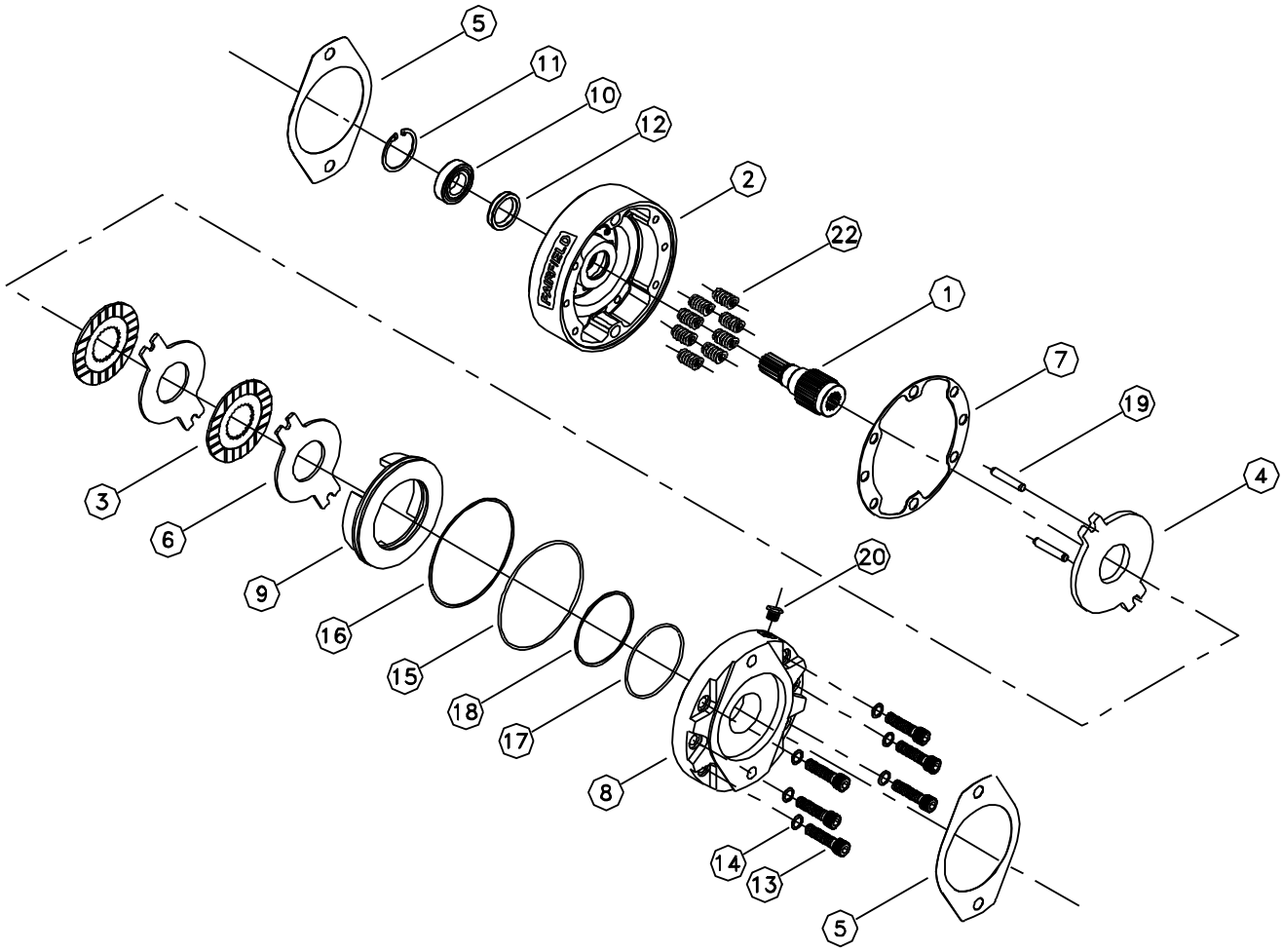
**Model: Short 'B' Mount (FBH13…..D) Series**

Spring Applied, Hydraulically-Released Multiple Plate Brake for Dry Operation.

3) Assemble correct quantity of springs (22 & 23) in orientation required.
4) Lubricate 'O' ring seals (15 & 17) with Molykote 55M (or equivalent) silicon grease and assemble together with backing rings (16 & 18) to piston (9). To ensure correct brake operation, it is important that the backing rings are assembled opposite to the pressurized side of piston (9).
5) Correctly orientate piston (9) aligning spaces with the two dowel pin holes and, assemble into cylinder housing (8) taking care not to damage seals and carefully lay aside.
6) Locate 2-off pins (19) in housing (2) followed by pressure plate (4) and friction plates i.e. an inner (3) followed by an outer (6) in correct sequence.
7) Position gasket (7) in correct orientation.
8) Align two holes in cylinder with dowel pins (19) and assemble piston & cylinder sub-assembly to remainder of brake securing with 6-off SHCS and washers (13 & 14). Torque tighten to 55 lbF.ft (75 Nm).

**Note:** The use of a suitable press (hydraulic or arbor) pressing down on cylinder end face 'B' will ease assembly of the SHCS (13).

**Note: If new friction plates have been assembled, it is recommended that the friction faces are "bedded in" to help ensure stable torque performance.**



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## SPARES KITS.

a) **Friction Disc Kit AMFBH13DA1** comprising
- 1-off pressure plate (item 4)
- 1-off gasket (item 7)
- 2-off outer plates (item 6)
- 2-off inner plates (item 3)

b) **Spring Kit AMFBH03B1** comprising
- 12-off springs BHB-1700 (color : natural)

c) **Spring Kit AMFBH03B2** comprising
- 12-off springs BHB-1701 (color : blue)

d) **Seal Kit AMFBH03C1** comprising
- 1-off gasket (item 7)
- 1-off 'O' ring (item 15)
- 1-off backing ring (item 16)
- 1-off 'O' ring (item 17)
- 1-off backing ring (item 18)
- 2-off gaskets (item 5)

e) **Bearing Kit AMFBH03D1** comprising
- 1-off gasket (item 7)
- 1-off bearing (item 10)
- 1-off rotary shaft seal (item 12)
- 1-off internal retaining ring (item 11)

**CHART OF SPRING OPTIONS.**

**Note: Two types of springs are incorporated in the FBH13…..D Series Brakes, BHB-1700 (natural color) & BHB-1701 (blue color).**

| Brake Model | Quantity of BHB-1700 natural colored springs. | Quantity of BHB-1701 blue colored springs. | Initial Release Pressure (psi) | Full Release Pressure (psi) |
|---|---|---|---|---|
| **FBH13…08D** | 4 | - | 62 | 66 |
| **FBH13…10D** | 4 | 2 | 78 | 82 |
| **FBH13…12D** | 6 | - | 93 | 99 |
| **FBH13…14D** | 6 | 2 | 109 | 115 |
| **FBH13…16D** | 8 | - | 124 | 130 |
| **FBH13…18D** | 8 | 2 | 140 | 150 |
| **FBH13…20D** | 10 | - | 155 | 165 |
| **FBH13…22D** | 10 | 2 | 172 | 180 |
| **FBH13…24D** | 12 | - | 187 | 195 |

Other models are available. Consult Fairfield Manufacturing Company, Inc. for further information.